A STUDY ON THE USEFULLNESS OF PEDIATRIC APPENDICITIS SCORING SYSTEM IN THE DIAGNOSIS OF ACUTE APPENDICITIS.

Dissertation
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CERTIFICATE

This is to certify that this dissertation titled ***"A STUDY ON THE USEFULLNESS OF PEDIATRIC APPENDICITIS SCORING SYSTEM IN THE DIAGNOSIS OF ACUTE APPENDICITIS."*** is the bonafide work done by **Dr. SATHYANARAYANAN M.,** Post Graduate student (2011 – 2014) in the Department of General Surgery, Government Stanley Medical College and Hospital, Chennai under my direct guidance and supervision, in partial fulfillment of the regulations of The Tamil Nadu Dr. M.G.R Medical University, Chennai for the award of M.S., Degree (General Surgery) Branch - I, Examination to be held in April 2014.

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DECLARATION

I, **DR.M.SATHYANARAYANAN** solemnly declare that this dissertation titled "***A STUDY ON THE USEFULLNESS OF PEDIATRIC APPENDICITIS SCORING SYSTEM IN THE DIAGNOSIS OF ACUTE APPENDICITIS "*** is a bonafide work done by me in the Department of General Surgery, Government Stanley Medical College and Hospital, Chennai under the guidance and supervision of my unit chief.

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Place: Chennai.
Date: December 2013. **DR.M.SATHYANARAYANAN**

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ABSTRACT

Acute appendicitis is the most common surgical emergency worldwide. If not detected early and treated, it can lead to perforation, peritonitis,& abscess formation. Despite many advances in imaging modalities, the diagnosis of this condition is essentially clinical. In children, because of poor development of omentum, the rate of perforation is high. Hence to detect this condition early and to reduce the rate of negative appendicitis in children, many scoring systems have been developed. Our study deals with the PEDIATRIC APPENDICITIS SCORING SYSTEM by ,Madhan Samuel. In this study, about 50 children between the age group 4-15 years of age presenting with acute abdominal pain to Govt Stanley Medical College were selected and PAS was applied. Each of them were assigned a score based on 8 variables to a total score of 10.They were into 3 groups those with >8 were taken up for surgery, <4 were discharged and those with scores 5-7 were subjected to imaging and taken up for surgery if proven by imaging. The groups were compared and the sensitivity of the test was 97%, specificity was 85 % and positive predictive value was comparable to the original study. The study showed that PAS can be used as adiagnostic tool in the diagnosis of acute appendicitis in children.

CONTENTS

INTRODUCTION:

Appendicitis refers to inflammation of the appendix due to 3to various etiologies and is the most common general surgical emergency worldwide. Acutely inflamed appendix can be removed surgically either by laparoscopic or open technique and is the most commonly performed emergency general surgical procedure. But the diagnosis of acute appendicitis can be difficult and challenging in certain circumstances. Though there have been many advances in imaging diagnostic modalities the diagnosis of acute appendicitis is essentially clinical. Hence various clinical scoring systems have been developed to diagnose or exclude appendicitis. Delaying intervention in acute appendicitis or failure to diagnose at the earliest can result in severe complications especially in children and elderly. The incidence is about 8% and is common between ages 10 to 30 with male: female ratio of 1.8:1[1].

Though there are several scoring systems in the adult for diagnosis of appendicitis the sensitivity and specificity of such scoring system drops when applied to children due to differences in clinical presentation. Hence several pediatric appendicitis scoring systems have been developed to improve the diagnostic rate in children. This can not only pick up cases

early but is also cost effective and avoids indiscriminate use of imaging studies in children.

Of these the most commonly used scoring system is the PEDIATRIC APPENDICITIS SCORING SYSTEM developed by MADHAN SAMUEL. There are 8 variables that are used to clinically score and categorize children into 3 categories upon a total score of 10; namely, those with scores less than 3, and those with 4 to 6 and those with 7 to 10. Those children with scores over 7 had a high probability of appendicitis and subsequently were taken up for surgery. Those with scores less than 3 were discharged and subsequently followed up as out-patients. Those with scores with 4 to 6 were subjected to further imaging studies and were followed up as in-patients till pain is relieved or another alternate diagnosis is arrived and treated accordingly.

AIMS AND OBJECTIVES:

To study the usefulness of PEDIATRIC APPENDICITIS SCORE in the diagnosis of acute appendicitis in children by correlating the clinical diagnosis obtained by scoring system with intra-operative findings and post operative HPE report.

REVIEW OF LITERATURE

Berengarius Carpus a professor of surgery at Pavia was the first to describe vermiform appendix in 1522.

Clado described a fold of peritoneum running from the ovary to the meso appendix, and since then known as Clado's ligament.

Reginald Fitz was the first one to coin the term appendicitis.

McBurney in 1889 described his classical sign- tenderness at the point of two-third and one third junction of the line drawn from umbilicus to anterior superior iliac spine in acute appendicitis.

Claudius Amyand was the first to remove the appendix in 1735 in a hernia surgery.

McBurney described his original muscle splitting operation in 1893 and this was modified by Weir in 1900.

The first laparoscopic appendectomy was done by KURT SEMM in 1980.

ANATOMY OF THE APPENDIX AND ITS SIGNIFICANCE

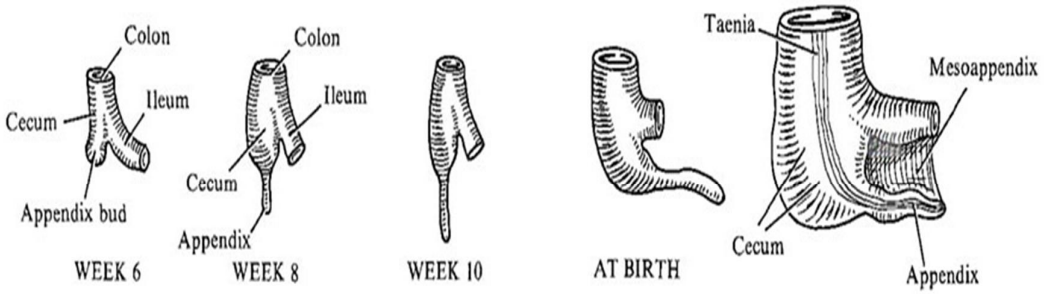
The appendix is a derivative of midgut and arises from the cecum as a small outpouching that gradually elongates into a worm-like tubular organ.

The cecal diverticulum appears in 6^{th} week of gestation and is the primordium for both the cecum and the vermiform appendix.

The diverticulum appears as a conical pouch on the antimesenteric border of the caudal limb of the midgut loop and descends from above.

The distal end of the blind sac retards in growth, thus the appendix-a vestige of the incomplete development of the cecum, develops.

During the elongation of the proximal colon, the cecum and the appendix descend from the right upper quadrant of the abdomen to its anatomical location in right iliac fossa.



DEVELOPING CECUM AND APPENDIX

The base of the appendix shifts medially during growth due to excessive growth of right and anterior walls of the cecum.Failure of such growth may result in a funnel-shaped appendicular base.

GROSS ANATOMY :

Verminform appendix is a tubular worm-like organ arising from the cecum. Average human appendix measures 2 to 20 cm in length. The diameter of the appendix is about 7-8mm. The largest appendix ever removed measured 26 cm in length from a patient in Crotia.

RELATIONS:

The appendix is related posteriorly to the ilio-psoas muscle and lumbar plexus of nerves.

Anteriorly its related to the abdominal wall, greater omentum and coils of intestine.

In cadaver the apex is found medial to mid-point of right inguinal ligament.

In living individuals the position varies with posture, state of distension of bowel, muscle tone, and respiration.

In upright posture the cecum and appendix overhangs the pelvic brim.

The tip of the appendix can point toward any organ except toward the spleen

The vermiform appendix has;

1.base attached to the cecum

2. body

3. tip, and

4.a mesoappendix through which the blood supply is derived.

The position of the base is fairly constant in location at about 2cm below the ileo-cecal valve, but the tip of the appendix is highly variable in position

BLOOD SUPPLY:

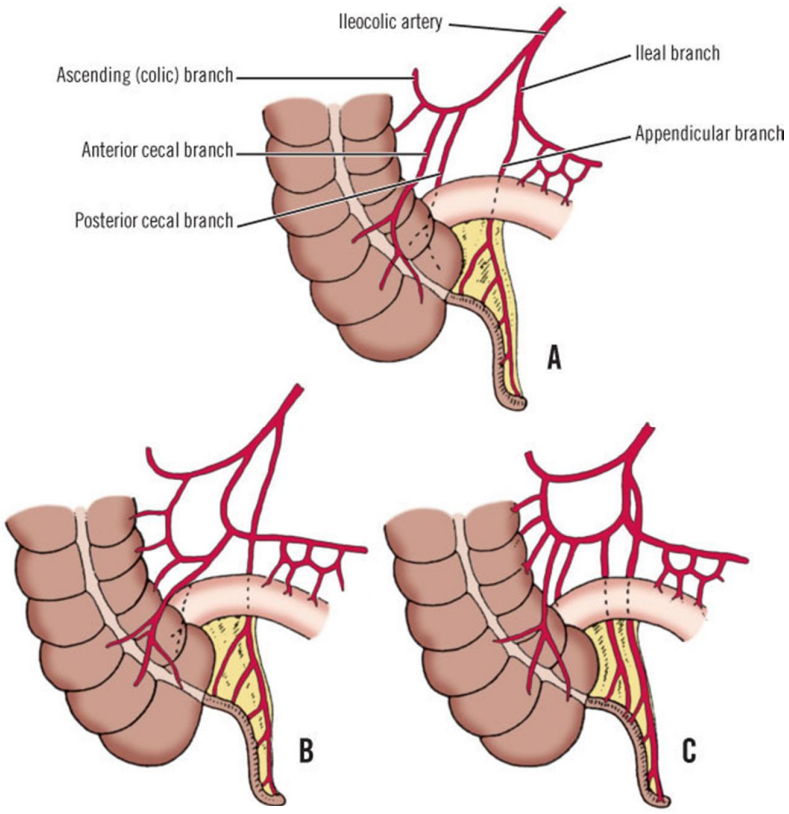
There are 4 patterns of arterial supply for the appendix, namely.,

1.single appendicular artery

2.paired appendicular arteries

3.arterial loop from the anterior cecal,posterior cecal, and ileo-colic arteries forming accessory appendiceal arteries.

4.anterior and posterior appendicular arteries supplying from the base .Of these the most common pattern is the single appendicular artery.



Another artery called the artery of Sheshachalam which is a branch of posterior cecal artery also supplies the appendix.

Veins from the appendix drain into the ileo-colic vein which in turn drain into the superior mesentric vein

NERVE SUPPLY:

Its innervated by the vagus nerve for parasympathetic supply and the superior mesentric plexus for sympathetic supply.

LYMPHATIC SUPPLY:

Lymphatics drain into the ileo-colic lymph nodes.

These ileo-colic nodes further drain into superior mesentric to the celiac nodes and finally cisterna chyli.

The lymphatic drainage of the wall of the appendix drains into the lumen and is different from the lymphatic drainage of the organ.

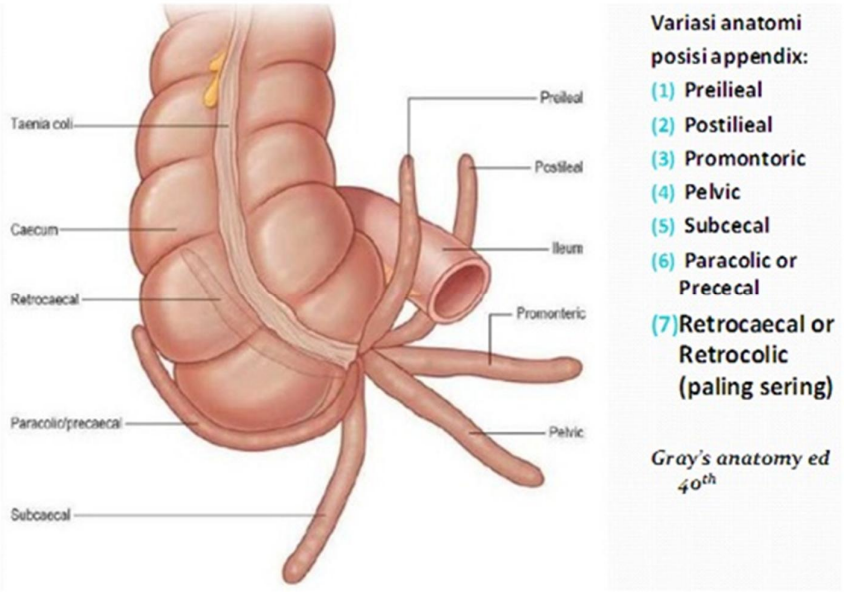
There is a secondary lymphatic drainage as described byBraithwaite with the nodes draining into the sub-pyloric nodes anterior to the pancreas.

TOPOGRAPHY OF APPENDIX AND ITS VARIOUS POSITIONS:

In malrotation of the midgut the appendix may be found in the left iliac fossa resulting in pain in that region in acute appendicitis.In old age people, the appendix may become cord-like and very rarely the appendix may be altogether absent.

The location of the appendix can be anywhere from its initial position in the right upper quadrant of the abdomen in utero to its final location in the right iliac fossa which is the most common location for the appendix.

Also the position of the tip is highly variable and its unusual position can pose difficulties in diagnosis of appendicitis and also during surgical removal.



The most common location for the appendix is retrocecal followed by pelvic position.the following are the percentage of various positions of the appendix.

Retrocecal-64%

Pelvic -32%

Sub-cecal-2%

Pre-ileal-1%

Post-ileal-0.5%

Para-colic and pro-monteric < 0.5 %

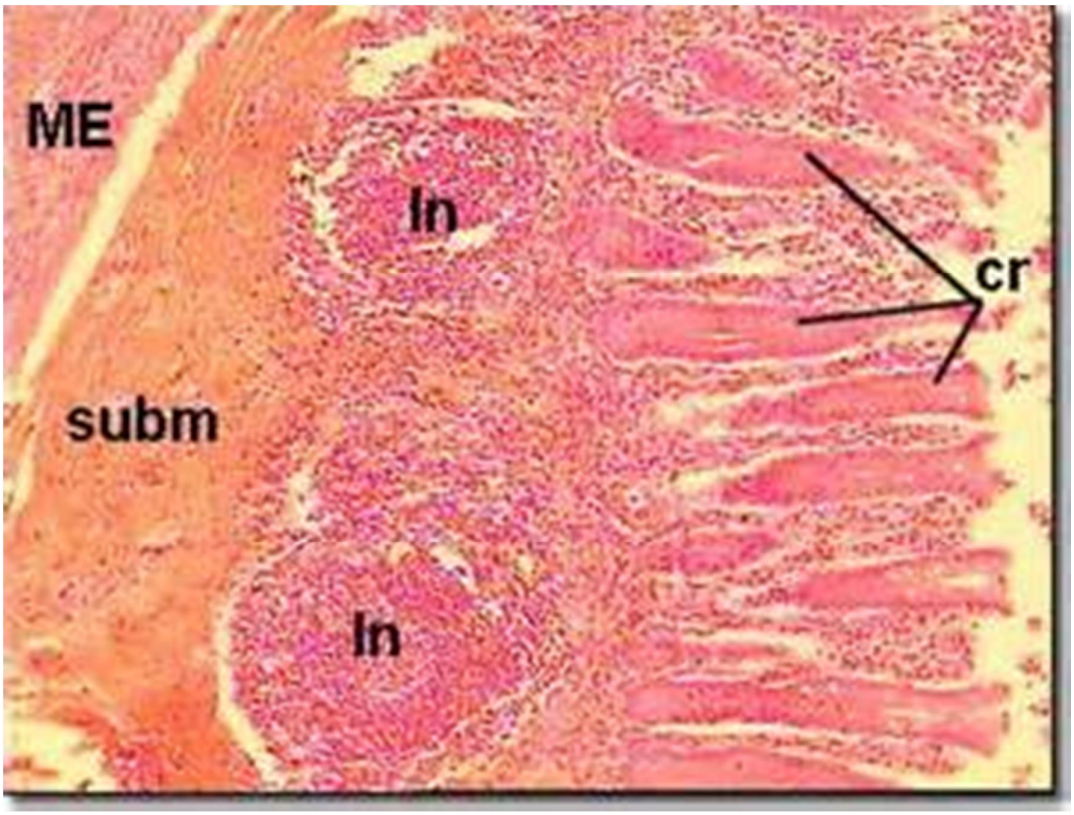
HISTOLOGY:

The appendix histologically has four layers – mucosa, sub-mucosa, an inner circular and an outer longitudinal muscle layer and a serosa. The appendicular lumen is stellate in cross-section.

The mucosa of the appendix is rich in mucinous glands and crypts. The mucosa also contains neuro-endocrine cells , histiocytes and eosiniphilic cells.

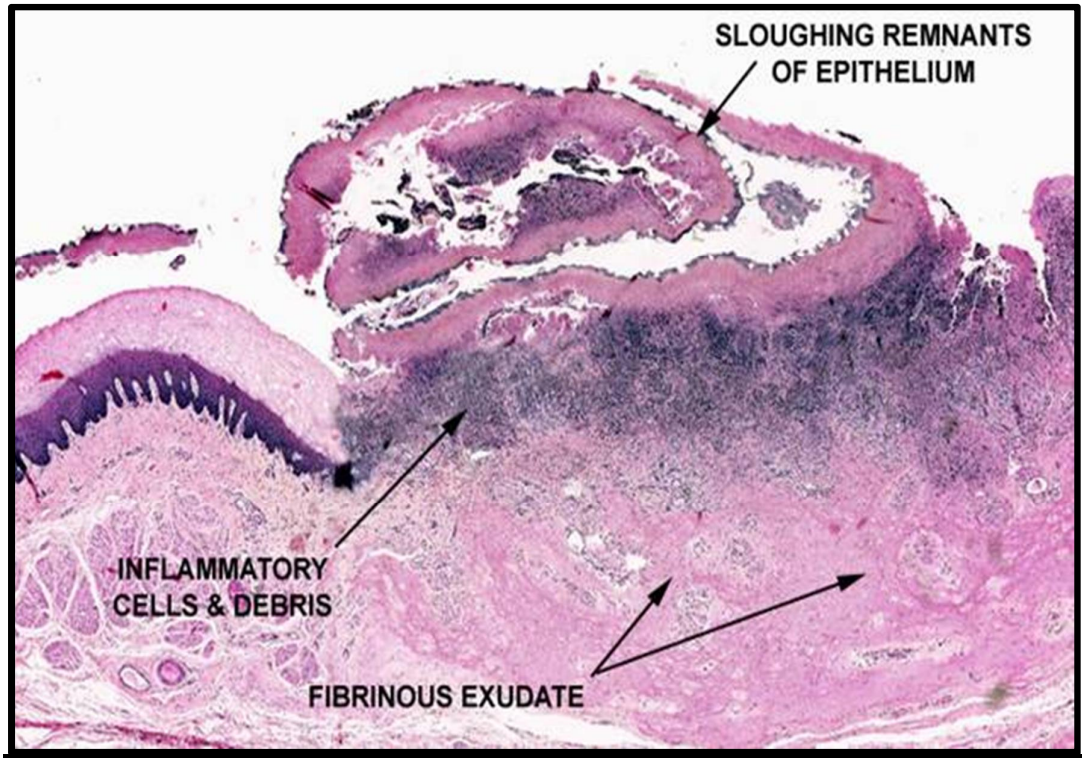
The base of the crypts contain paneth cells with basal nuclues, conspicuos nucleoli and abundant eosinophilic cytoplasm.

The appendix is essentially a lymphoid rich organ with abundant lymphoid follicles in its lamina propria – functionally part of the gut associated lymphoid tissue.These lymphoid follicles get inflammed and when they do so they can cause acute appendicitis.They are abundant in children and they are far less in adults.



Histology of normal appendix

This picture shows mucosa and submucosa and muscularis externa layers with lymphoid collicles in the lamina propria. The mucosa also contains crypts with mucuc secreting glands.



The altered histology in appendicitis

Picture shows epithelial sloughing and extensive neutrophil infiltration of the mucosal and sub-mucosal layer with protein-rich fibrinuos exudate .

PATHOPHYSIOLOGY OF ACUTE APPENDICITIS

There are basically two major types of pathological processes involved in acute appendicitis.

1. obstructive type,

2. non-obstructive type(acute catarrhal).

1. Obstructive type:

The major cause of acute appendicitis is the obstruction of the appendiceal lumen. This is due to

1. inspissated stool (fecalith or appendicolith),
2. lymphoid hyperplasia,
3. vegetable matter or seeds,
4. worms- Balantidinum coli, Enterobius vermicularis, Schistosomia hematobium
5. barium from previous contrast studies.
6. a neoplasm.

   The lumen of the appendix is very small with respect to its length, and this predisposes to closed-loop obstruction.

Obstruction of the lumen causes bacterial overgrowth, and continuous secretion of mucus by mucinous cells.

This leads to distention of lumen and increase in transmural pressure.

This distension causes visceral pain experienced by the patient as periumbilical pain.

Resulting impaired lymphatic and venous drainage causes mucosal ischemia.

These process combine to cause a localized inflammatory process which progresses to gangrene and perforation.

Inflammation of the adjacent parietal peritoneum causes localized pain in the right iliac fossa.

Usually , perforation typically occurs after 48 hours from the onset of pain and is followed by formation of an abscess cavity .

This abscess cavity is walled-off by small intestine and omentum.

Sometimes , free perforation of the appendix into the peritoneal cavity may result in peritonitis and peritoneal sepsis.This may complicate as multiple intra-abdominal abscesses.Sometimes even plueral effusion may occur as a reactive effussion.

Factors encouraging Progression of Inflammation:

(i) Very young or old age.

(ii) Immunosupression.

(iii) Free lying appendix.

(iv) Presence of faecolith.

(v) Purgatives.

(vi) Impaired blood supply.

2.**NON-OBSTRUCTIVE TYPE**:

In this type, the inflammation commences either at the mucous membrane of the appendix or in the lymph follicles and terminates either as

1. resolution,

2.ulceration

3. suppuration

4.fibrosis or

5. gangrene.

The infection progresses rapidly once it reaches the submucousal layer.

The organ becomes inflammed, turgid, dusky red and haemorrhage into the mucous membrane occurs. The distal part of the appendix is often prone to ischaemia as the artery is intramural and is liable to occlusion by inflammation and thrombosis thereby, leading to gangrene of the tip of the appendix.

The non-obstructive type progresses slowly and a protective barrier is formed and the inflammation does not progress beyond the mucosal lining and the attack wanes off without sequelae.This is known as acute catarrhal appendicitis.

But this catarrhal type is notorious to recur causing frequent attacks many a times a year in few cases. In that case an elective or emergency appendectomy has to be planned otherwise it may result in chronic recurring pain.

CHRONIC APPENDICITIS: This is condition of gradual inflammation of the appendix leading to frequent episodes of right lower quadrant pain.The clinical features are milder than acute appendicitis but usually complete resolution does not occur and necessitates appendectomy.

Bacteriology of appendicitis:

The normal appendix contains flora that is very similar to that of the colon.

It contains both facultative aerobic and anaerobic bacteria. Thus the cultures in perforated appendicitis is polymicrobial in nature, namely,

1. *Bacteroides*
2. *Pseudomonas*
3. E.coli
4. Streptococcus viridians species

In patients with acute non-perforated appendicitis, cultures from peritoneal fluid are frequently negative.

But in patients with peritoneal contamination due to perforation, cultures are frequently positive with adequate sensitivity to antibiotics for proper selection of anti-biotics in post-operative period.

Also the virulence of these organisms in extreme enough to cause endotoxic shock.

Bacteria Commonly Isolated in Perforated Appendicitis

ANAEROBIC	PATIENTS (%)
Bacteroides fragilis	80
Bacteroides thetaiotaomicron	61
Bilophila wadsworthia	55
Peptostreptococcus species	46

AEROBIC	
Escherichia coli	77
Streptococcus viridians	43
Group D streptococcus	27
Pseudomonas aeruginosa	18

CLINICAL FEATURES:

HISTORY

Appendicitis should be considered as a differential diagnosis in almost every patient with acute abdominal pain. Early diagnosis is important in patients with suspected appendicitis and can usually be made on the basis of history and physical exam. The typical presentation is an adolescent male or female with periumbilical pain followed by anorexia, nausea and vomiting.

The pain then localizes to right iliac fossa as the inflammation progresses to involve the parietal peritoneum overlying the appendix. This is a classic pattern of acute appendicitis.

This migratory pain is the most reliable symptom of acute appendicitis but the symptom is not always present.

The patient may have a bout of vomiting. This is in contrast to repeated bouts of vomiting that occurs in viral gastroenteritis or intestinal obstruction. Fever ensues, followed by leukocytosis.

But clinical features may vary. The classic triad of pain followed by vomiting followed by fever is seen only in a small percentage of patients.

Rarely, patients may have urinary symptoms or microscopic hematuria, owing to the inflammation of periappendiceal tissues that are adjacent to the ureter or bladder, and this may be mislead one to consider ureteric colic as the first in differential diagnoses.

Most patients with appendicitis develop an adynamic ileus and absent bowel movements, but occasional patients may present with diarrhea. Some may present with acute small bowel obstruction due to contiguous regional inflammation and adhesion.

Therefore, appendicitis can be a possible cause of small bowel obstruction, especially in patients without prior history of abdominal surgery.

ATYPICAL PRESENTATIONS :

The position of the tip of the appendix can also result in a myriad of different presentations.

1.Right hypochondrial pain- pulled up cecum or cecum that had arrested in its path of descent.

2.Diarrheoa- pre and post-ileal type

3.lower abdomen pain-pelvic type of appendix.

4.urinary frequency- retro-cecal type of appendicitis with peri-appendiceal inflammation.

PHYSICAL EXAMINATION :

Acute appendicitis patients typically have a sick look and lie still in bed.

Usually it is accompanied by a low-grade fever (~38°C) .

Local Examination of the abdomen reveals diminished bowel sounds and tenderness at the right lower quadrant with guarding.

The exact site of tenderness is most commonly at McBurney's point – which is at one third of the distance along a line drawn from the anterior superior iliac spine to the umbilicus-this point is directly over the appendix.

The normal appendix is a mobile organ, so it may become inflamed at a point anywhere on a 360-degree circle about the base of the cecum. Hence, the site of maximal point of tenderness may vary.

Peritoneal irritation is elicited by the findings of guarding on percussion, or rebound tenderness.

The following signs may be elicited-

1. *Dunphy's sign-pain over right iliac fossa on coughing.*

2. *Rovsing's sign*- pain in the right iliac fossa on palpation of the left iliac fossa.

3. *Obturator sign* -pain on internal rotation of the hip in case of a pelvic appendix.

4. Cope’s ilio-psoas test- pain on extension of right hip in a retro-cecal appendix.

5. Digital rectal examination- If the appendix is located within the pelvis tenderness on palpation of the abdomen is minimal, but anterior tenderness may be elicited during digital rectal examination on manipulation of pelvic peritoneum.

6. Per-vaginal examination- movement of the cervix may cause tenderness in a pelvic appendix.

7. In perforated appendicitis- the abdominal pain intensifies and is more diffuse. Abdominal wall muscle spasm increases causing rigidity. Tachycardia with fever may ensue. The patient appears ill and is briefly resuscitated with fluid and antibiotics are administered.

Sometimes pain may improve slightly after rupture of the appendix due to decrease in wall tension.

Box 2 Anatomical position of the appendix and possible changes in clinical presentation

Retrocaecal/Retrocolic (75%)—Right loin pain is often present with tenderness on examination. Muscular rigidity and tenderness to deep palpation are often absent due to protection from the overlying caecum. The psoas muscle may be irritated in this position leading to hip flexion and exacerbation of the pain on hip extension (psoas stretch sign).

Subcaecal and Pelvic appendix (20%)—Suprapubic pain and urinary frequency may predominate. Diarrhoea may be present due to irritation of the rectum. Abdominal tenderness may be lacking but rectal or vaginal tenderness may be present on the right. Microscopic haematuria and leucocytes may be present on urinalysis.

Pre and Post-ileal (5%)—Signs and symptoms may be lacking. Vomiting may be more prominent and diarrhoea due to irritation of the distal ileum.

LABORATORY INVESTIGATIONS:

The following findings are noted:

1. Leucocytosis- a WBC count of more than 20000 is indicative of perforated or gangrenous appendicitis.
2. Neutrophilia .
3. Microscopic hematuria
4. Pyuria –in case of ureteric involvement in retro-cecal appendix.
5. C-REACTIVE PROTEIN- elevated levels in a patient with clinical findings suggestive of appendicitis highly favours diagnosis.

IMAGING:

X-Ray findings-

In 10-15% of patients a calcified appendicolith may be seen.

In barium enema, failure of the appendix to fill with contrast is a sign of appendicitis. Upto 20% of normal appendix also does not fill with contrast.

ULTRASONOGRAM-

1. Sensitivity -85 %

2. Specificity-90%

POSITIVE FINDINGS in favour of acute appendicitis include;

1. Antero-posterior diameter of the appendix >7mm.
2. Target lesion- a thick-walled, dilated non-compressible, aperistaltic structure.
3. Appendicolith
4. In appendicular mass,peri-appendiceal fluid collection or mass formation may be seen.
5. RING of FIRE APPEARANCE- increased flow in case of inflamed appendix.

ADVANTAGES-

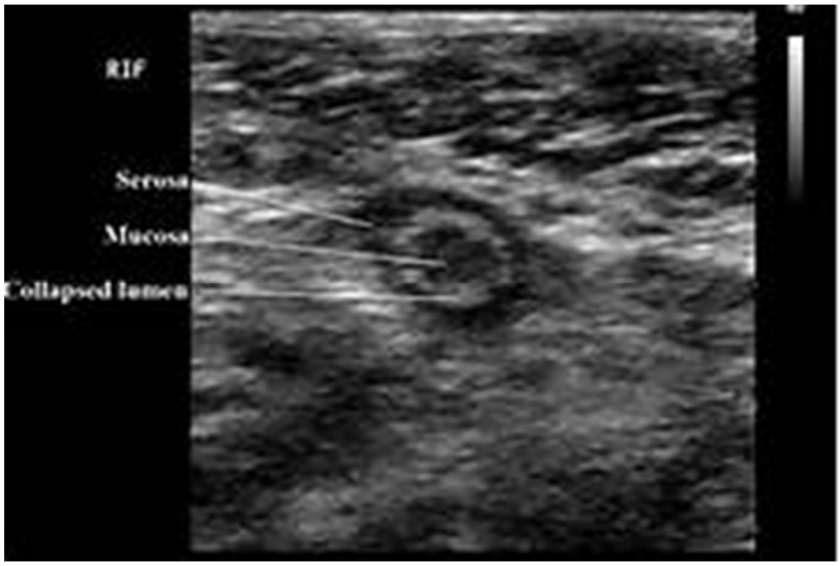
1. Non-invasive

2. No radiation-may be used in children and pregnant females.3.Color Doppler studies can be done to establish gangrenous appendix.

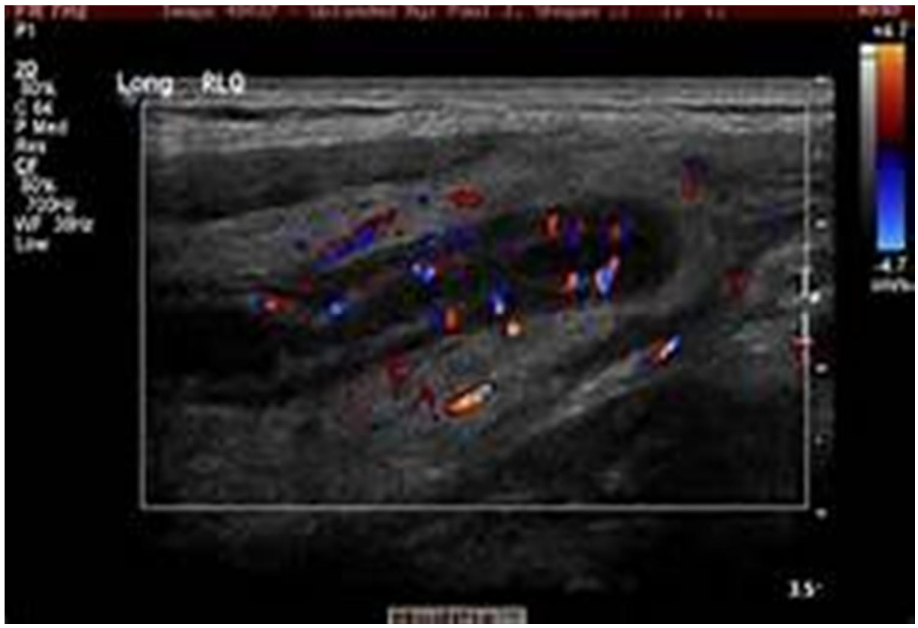
DISADVANTAGES-

1.Operator dependant

2.In 10-15% of cases, appendix may not be detected.



Target sign in acute appendicitis



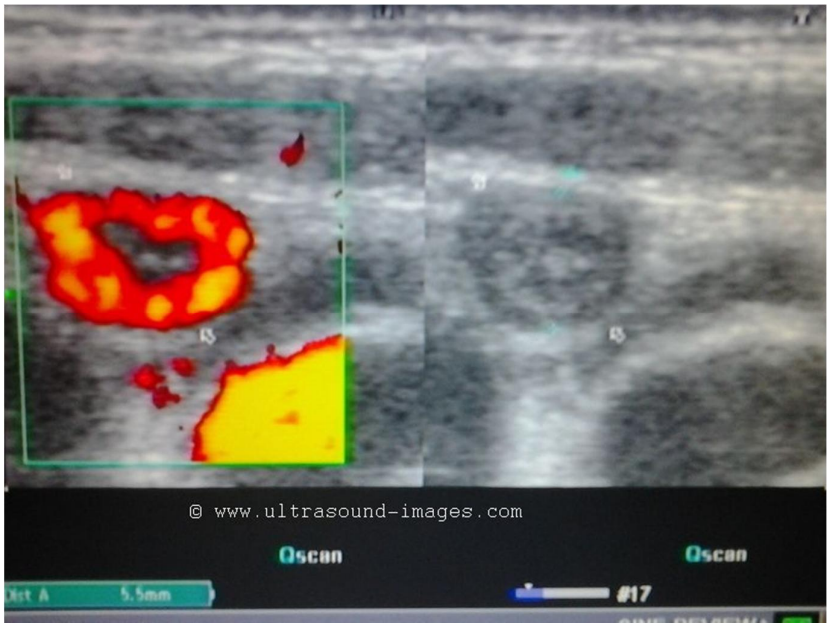
Hypervascularity of appendix in acute appendicitis

This is well seen in color Doppler USG. The incresded flow appears in red and blue, blue denoting venous flow and red arterial.

Obliteration of fat plane in the psoas region- psoas sign , a feature of acute appendicitis especially retrocecal appendicitis

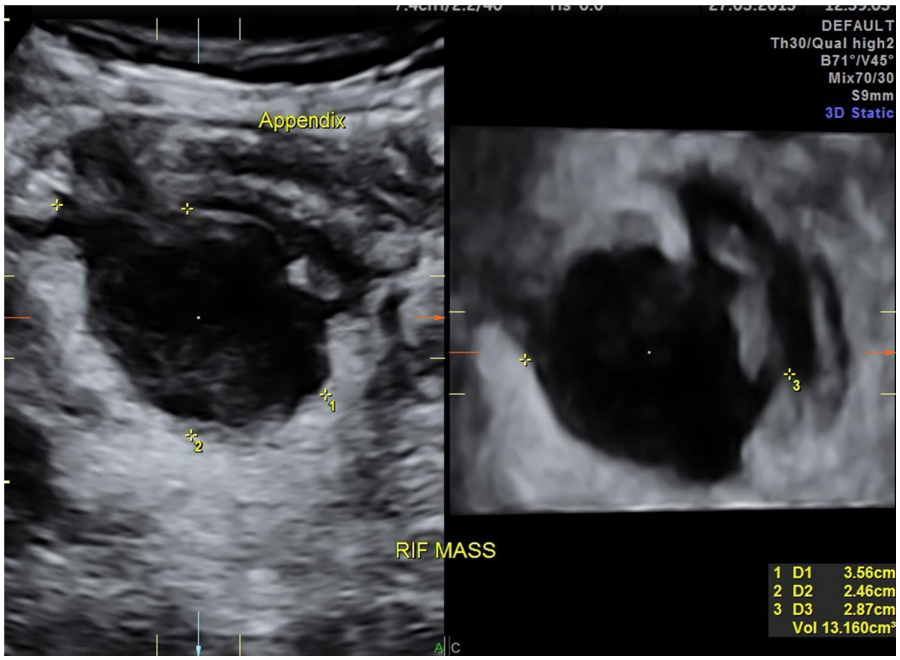
ULTRASONOGRAM of the abdomen showing inflamed appendix as a aperistaltic, dilated loop –longitudinal view

The appendix appears as a non-compressible aperistaltic structure which upon graded compression shows tenderness.



‘Ring of fire appearance’ in color Doppler in transverse view

This is the diagnostic sign in Doppler USG. This is due to extensive inflammation and increased flow in peri-appendiceal vesssels and appendicular artery



Appendicular mass in Ultrasonogram

Hetoroechoic mass in the right iliac fossa formed by inflamed appendix, small bowel, omentum with fluid collectin and abscess formation.

COMPUTED TOMOGRAHY-

Sensitivity- 90%

Specificity -80 to 90%.

Positive predictive value- 75%.

CT findings include-

1. Thickened dilated appendix with diameter more than 7 mm.

2. Target sign-circumferential wall thickening appearing as a halo on CT.

3. Peri-appendiceal fat stranding

4. Appendicular abscess

5. Phlegmon

6. Appendicolith

Target sign in CT

Intense contrast-enhancing appendicular wall in appendicitis. This is due to hypervascularity and venous congestion and increase in thickness of the appendiceal wall

Appendicolith in CT

Appendicoliths may vary in size and number and appear as hyperattenuated images in CT.

Appendicular mass in contast CT.

Hyperattenuated mass in RIF in contrast CT with peri-appendiceal fat stranding.

DIAGNOSTIC LAPAROSCOPY

Most patients with acute appendicitis can be accurately diagnosed based on history, clinical exam, laboratory studies, and, imaging, but in some patients the diagnosis still remains elusive.

For these patients, diagnostic laparoscopy can be of certain value.

D-lap can aid in complete survey of the abdominal organs for other possible causes of pain.

This technique can be used primarily for women of childbearing age in whom preoperative pelvic ultrasound or CT scan fails to provide a diagnosis.

Concerns about the possible adverse effects of a missed perforation and peritonitis on future fertility sometimes prompt earlier intervention in this patient population.

The diagnostic laparoscopy can also be therapeutic and appendectomy is done as a routine if no other alternate pathology is noted.Other pelvic pathologies that can mimic appendicitis are ovarian cyst, ectopic pregnancy,meckels diverticulum and mesenteric diverticulum.

DIFFERENTIAL DIAGNOSES:

1. INFANTS-

a. Intussusception- this is a common condition in children and ileocecal intussusceptions can sometimes mimic perforated appendicitis. Currant jelly stools. But a palpable mass in right hypochondrium and emptiness in right lower quadrant (dance sign) are the key features.

b. Hirshprung ‘s disease

c. Cystic fibrosis

2. PRE-SCHOOL CHILDREN-

a. Acute gastro-enteritis- this presents as diarrhea, vomiting and fever. The abdomen pain is colicky and periumblical but it can be diffuse and is often a close differential diagnosis.

b. Intussusception- has colicky intermittent abdominal pain, and positive Dance sign (Emptiness in right iliac fossa)

c. Meckel’s diverticulitis- pain is typically in the periumblical region and does not have specific radiation, may have associated diarrhea or blood in stools.

d. Mesentric lymphadenitis- this is too common in pre-school children and is usually secondary to upper respiratory tract infection or gastro-intestinal tract infection.

3. MALES

a. Pyelonephritis:

- this is an inflammation of the renal parenchyma and pelvis due to bacteria and variety of other causes.

-Pain is mostly in the flanks.

-Associated with fever and leucocytosis.

-Patient looks toxic and obtunded.

-On lab investigations- pyuria may be seen in urine analysis.

-Non –contrast helical CT is the investigation of choice. It may detect radio-opague stones and obstructed and dilated pelvi-calyceal system.

-Urine culture demonstrates organisms

-Treatment- i.v. anti-biotics , hydration, and surgical intervention such as percutaneous nephrostomy or ureteroscopy may be needed.

b. Colitis-

-this is inflammation of the colon and secondary to infections or inflammatory bowel disease, auto-immune, and variety of other causes .

-Symptoms are usually diarrhea and cramping right or left-sided abdominal pain with tenesmus,bloating, loss or appetite at times.

- treatment is usually antibiotics and treating the cause.

c. Ureteric colic:

-this is the most common entity confused with acute appendicitis.

Symptoms-

Pain – the site or pain depends on the location of the calculus. Upper ureteric calculus has pain in the loin. Ir radiates to the groin.

Lower uereteric calculi have pain in the right iliac fossa radiating to the external genitalia or medial side of thigh.

Pain is severe enough to cause the patient to “roll-over” bed, associated with sweating and vomiting.

USG abdomen- this reveals calculus and dilated pelvi-calyceal system if there is associated hydro-uretero-nephrosis.

Urine routine examination and culture is done.

Treatment –

1. NSAIDS, antibiotics and adequate hydration.

2. Calcium-channel blocker, diuretics and alpha-blockers may be tried.

3. Lithotripsy may be done in resistant cases.

Diverticulitis:

-This refers to inflammation of the diverticula or out-pouchings from the wall of large or small intestine.

The classical symptoms are left lower quadrant pain, fever and leucocytosis.

Sometimes, right lower quadrant pain may occur in pre-dominant right-colon involvement or a very redundant sigmoid colon.

Diagnosis –

CT abdomen is the investigation of choice. 5mm CT cuts are accurate in diagnosing diverticulosis and in acute diverticulosis, colonoscopy and barium contrast studies are contra-indicated.

Treatment -

Uncomplicated diverticulosis may be treated with anti-biotics and obsercation.

Complications of diverticulosis include perforation with peritoneal sepsis, bleeding, obstruction, and fistula formation.

Perforation-surgically treated by diversion procedures.

Bleeding and obstruction- resection and anastomosis.

WOMEN OF CHILD-BEARING AGE-

1. PELVIC INFLAMMMATORY DISEASE:

Infection of the female genital tract including the uterus, ovaries, fallopian tubes.

Associated with menorrhagia, lower abdominal pain and sometimes fever, dyspareunia,intermensrual bleeding. Cervical motion tenderness and leucorrhea are important distinguishing features.

Treatment-

Antibiotics – cephalosporin and aminoglycosides

2. OVARIAN CYST TORSION:

This is a gynecological emergency and can mimic as acute appendicitis.

This happens when a large ovarian cyst undergoes twisting at its pedicle and its blood supply is jeopardized.

This results in congestion and ischaemia of the ovaries and resultant gangrene may also occur.

Symptoms-

Sudden agonizing lower abdominal pain followed by vomiting, tachycardia and fever.

Doppler USG: Investigation modality of choice. Lack of blood flow to ovaries on Doppler confirms diagnosis.

Treatment:

This is surgical- laparoscopic ovarian cystectomy or oophorectomy is done. Also oophoropexy for a long mesorchium is done.

3. ECTOPIC PREGNANCY:

This presents as severe lower abdomen pain and tenderness in the hypogastric region. The ectopic pregnancy site can be fallopian tubes(most common), followed by ovaries and cervix.

Rupture of ectopic pregnancy into the abdominal cavity is a life threatening complication and can result in severe blood loss and hemorrghic shock.

Symptoms:

Pain over lower abdomen, pelvic pain or in low back. In ruptured ectopic, patient may have shoulder pain, which is an ominuous sign cause of diaphragmatic irritation.

There is associated tachycardia and pallor with signs of fall in BP and cold peripheries –signs of hemorrhagic shock.

Cullen’s sign- discolouration of peri-umblical region may be seen.

Diagnosis –

Trans-vaginal USG demonstrates absence of gestational sac in the uterus and presence of adnexal mass. These along with elevated beta-HCG levels above 1500 strongly correlates the diagnoses.

Treatment:

Unruptured ectopic pregnancy can be treated with methotrexate .

Ruptured ectopic pregnancy needs laparotomy and removal of conceptus, ruptured part , securing complete hemostasis.

IN PREGNANCY:

The main problem of appendicitis in pregnancy is that the usual symptoms of appendicitis such as nausea,vomiting, are also found in pregnancy.

Also the tip of the appendix is shifted up by the gravid uterus and the site of tenderness is usually at the right hypochondrial region by 5^{th} month. USG abdomen can be used safely to diagnose and in rare cases MRI abdomen can also be used. As the chances of fetal loss increases with peritonitis and sepsis, early surgical intervention is warranted in pregnancy with appendicitis.

Second trimester of pregnancy is usually safe for surgical procedures.

OLD AGE:

Appendicitis in old age is difficult to diagnose because of atypical presentation. Right lower quadrant pain is unusual and there is no fever.

Also appendicitis is thought of as a less likely diagnosis compared to diverticulosis or colitis and hence missed often. There is also no leucocytosis due to poor immunity. In elderly the cause for appendicitis should also be sought as even a cecal or appendicular malignancy could cause appendicitis hence imaging should be done in all cases.

APPENDICITIS IN INFANTS AND CHILDREN:

The diagnosis of acute appendicitis is difficult in infants and young children because children are unable to give an accurate history, and acute nonspecific abdominal pain is common in infants and children. Hence, the diagnosis and treatment are often delayed, and complications develop. The clinical presentation in children can be quite similar to nonspecific gastroenteritis. Hence, the suspicion of appendicitis often is not entertained until the appendix has ruptured.

Two thirds of young children with appendicitis have had symptoms for more than 3 days before appendectomy.Because children often cannot give an accurate history of their pain, the physical examination and other aspects of the history must be relied on to make the diagnosis. Vomiting, fever, irritability, flexing of the thighs, and diarrhea are likely early complaints. Abdominal distention is the most consistent physical finding. Also, the total leukocyte count is not a reliable test.

The incidence of perforation in infants younger than 1 year of age is almost 100%, and although it decreases with age, it is still 50% at 5 years of age. The mortality rate in this age group remains as high as 5%. In one series, nearly 40% of children with complicated appendicitis had been wrongly diagnosed with other causes of abdominal pain.

CLINICAL SCORING SYSTEMS FOR APPENDICITIS:

Acute appendicitis is essentially a clinical diagnosis. The sensitivity and specificity of clinical methods have proven to be more than imaging techniques.

To increase the diagnostic rate in appendicitis and reduce the rate of negative laparotomies, several scoring systems have been developed.

Of these the Alvorado scoring system has been the most commonly used scoring system and has a sensitivity of 80-85% in various studies.

It is a simple and useful diagnostic tool in adults in picking up cases early and also reduces rate of negative appendectomies.When combined with graded compression ultrasonography the diagnostic yield is still higher.

ALVORADO SCORING:

The Alvorado scoring system was first developed by Alfredo Alvorado of Philadelphia in 1986 an Nazreth hospital on a cohort of 305 patients.

Symptoms score

Migratory right iliac fossa pain		-1
Nausea/Vomiting		-1
Anorexia		-1

Signs

Tenderness in right iliac fossa		-2
Rebound tenderness in right iliac fossa		-1
Elevated temperature	>37.5 C	-1

Laboratory Findings

Shift to the left of neutrophils	>75%	-1
Leucocytosis	>10,000	-2

Total 10

The variables used in the scoring have can be remembered with the mnemonic MANTRELS. The scoring system has a maximum achievable score of 10.

Those with scores >7 – have high probability of appendicitis and are taken up for surgery. Those with scores 5-6 are subjected to further imaging and are subsequently either taken up for surgery or are observed depending on the imaging findings. Those with scores less than 4 are discharged and followed up as out patients.

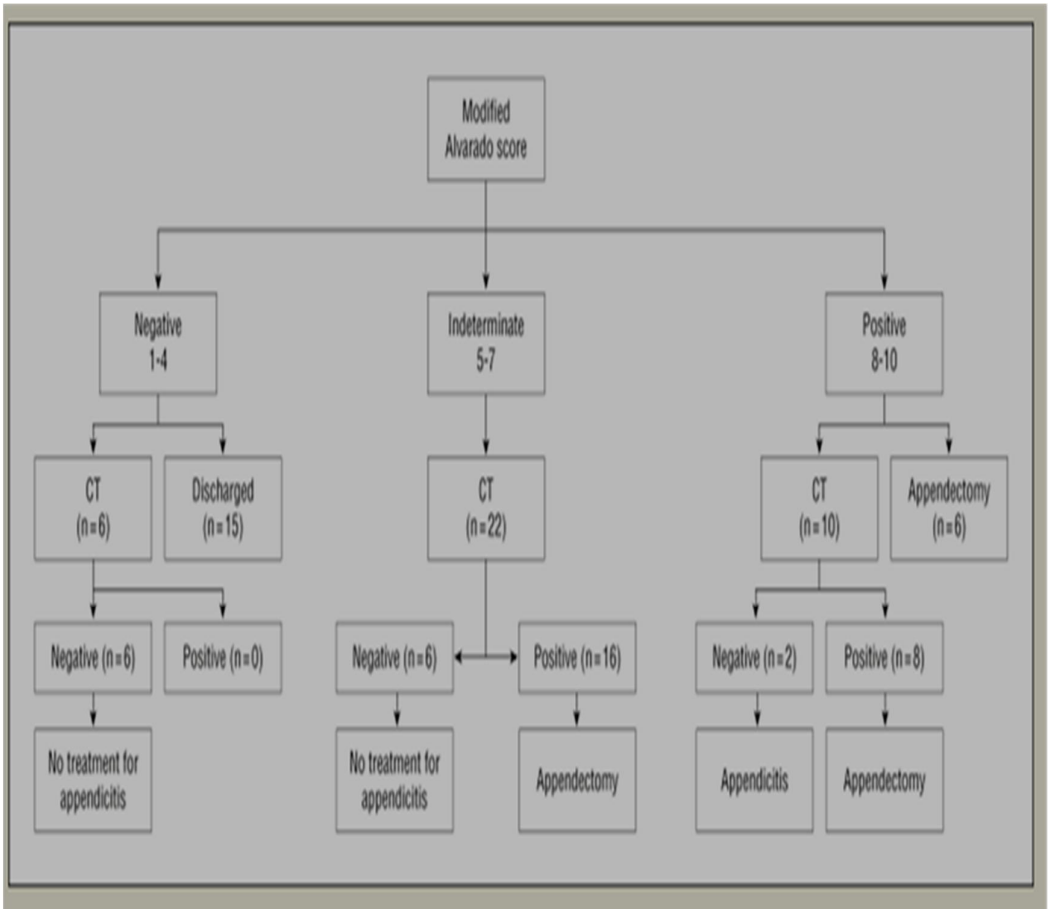
It had the following statistics:

Sensitivity – 80-85%

Specificity –85-90%

Positive predictive value- 92-96% .

But when applied to various groups such as men, women and children the sensitivity and specificity seem to drop by 10-15 percent when applied to women due to overlapping of symptoms due to multitude of conditions. But still its widely used for its ability to reduce false negative rates.



Management of Appendicitis based on modified Alvarado criteria

decision-making is based on Alvorado mscoring and added imaging improves accuracy

PEDIATRIC APPENDICITIS SCORE

It was first developed in 2002 by MADHAN SAMUEL of England.

It specifically addresses the symptomatology in children it was developed because:

1.rebound tenderness as in Alvarado scoring is extremely painful in children and can make them unco-operative, apprenhensive and hence should not be used in children.

2.variables such as leucocytosis and polymorphonuclear neutrophilia had good correlation and cough tenderness were assigned a score of 2 each to improve accuracy when applied to children. Variables such as cough tenderness and percussion tenderness are unique to children.

Children with score >8 were taken up for surgery and those with 4-7 were subjected to further imaging re-assessed with PAS and were either taken up for surgery or were followed up as in-patients depending on progression of symptoms, imaging findings and re-assessed PAS scoring.

VARIABLES IN PEDIATRIC APPENDICITIS SCORING SYSTEM

Finding	Points
Nausea/vomiting	1
Anorexia	1
Fever	1
Migration of pain	1
Leukocytosis	1
Neutrophelia	1
RLQ tenderness	2
Hopping/ percussion tenderness	2

OTHER SCORING SYSTEMS:

The Tzanakis scoring system – This incorporated ultrasound , clinical findings and lab investigations.

The Appendicitis inflammatory response score

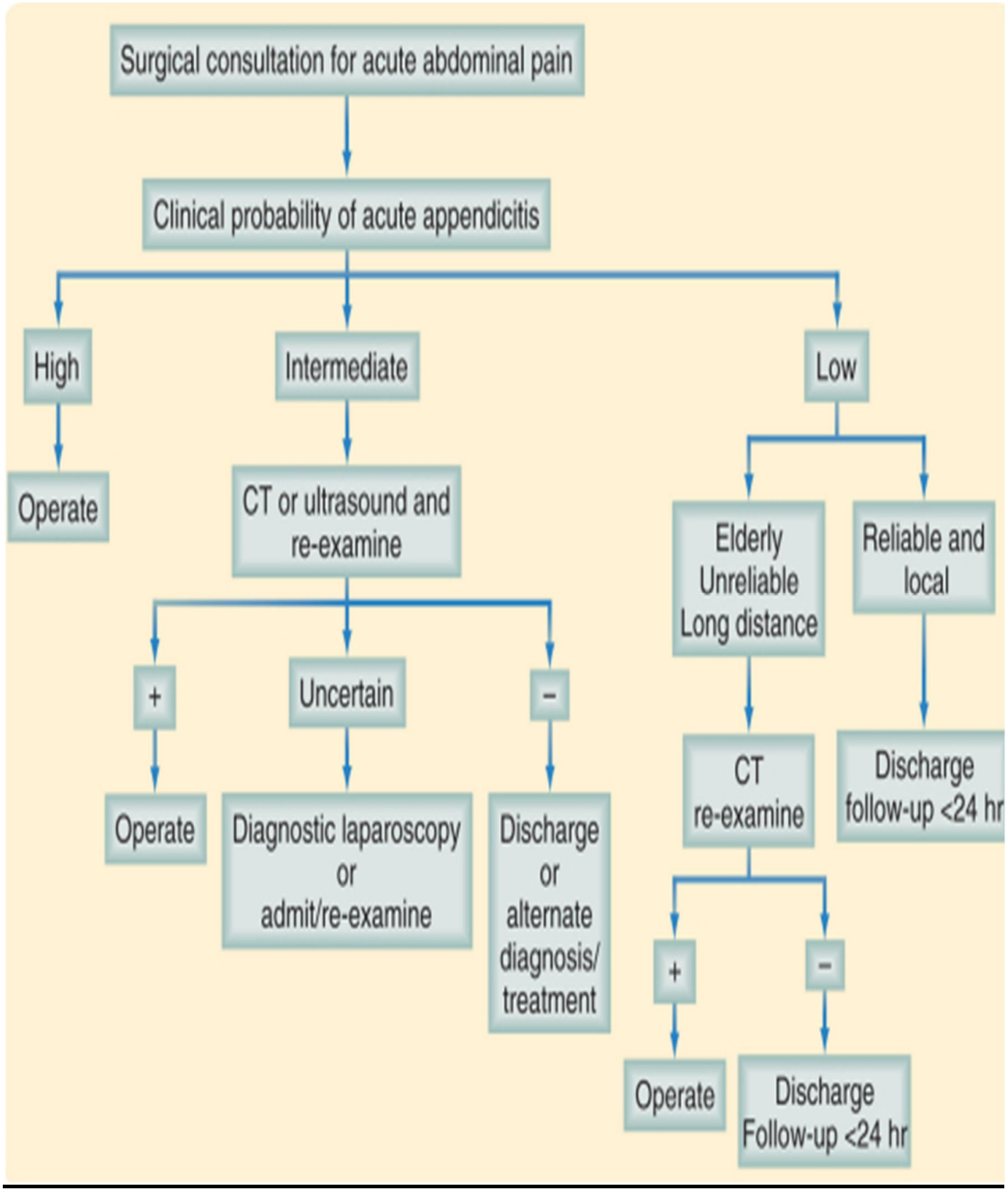
Ohmann scoring

Lintula scoring system

Fenyo-lindbang.

Computerised algorithms were developed for quicker assessment of symptoms and certain complex variables were also used.

SURGICAL MANAGEMENT OF APPENDICITIS



SURGERY- OPEN APPENDECTOMY:

Incisions :

1. Mcburney incision- The incision is made obliquely, beginning inferiorly and medially, and extending laterally and superiorly. It should be 8 to 10 cm in length, with its most medial extent being the lateral edge of the rectus muscle

2. Rockey Davis: The incision is made in a transverse direction, 1 to 3 cm below the umbilicus, and is centered on the midclavicular line.

3. Weir extension - medial extension of Rockey Davis.

4. Rutherford Morrisson- lateral extension of Rockey Davis

5. Lanz incision- incision along the langers lines.

STEPS:

With any one of the above incisions, skin and sub-cutaneous layers are cut. The aponeurosis and muscles of the abdominal wall are split or incised in the direction of their fibers and peritoneum is reached

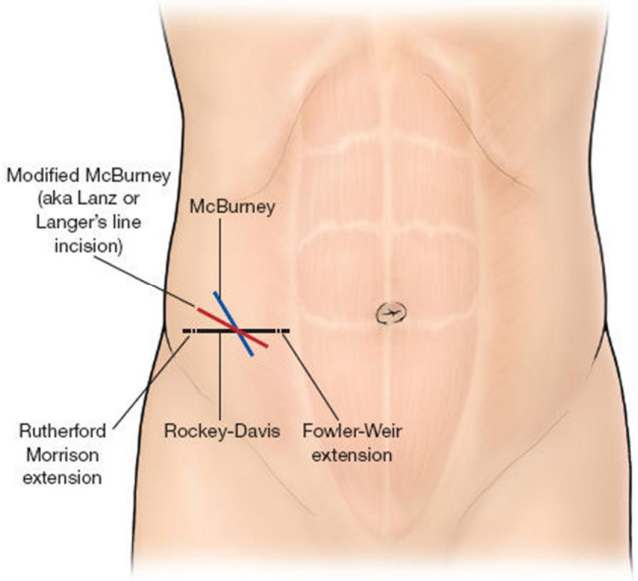
After the peritoneum is opened, the appendix is identified by following the anterior cecal taenia to the base of the appendix.

In difficult appendix, aids in recognition include the following:

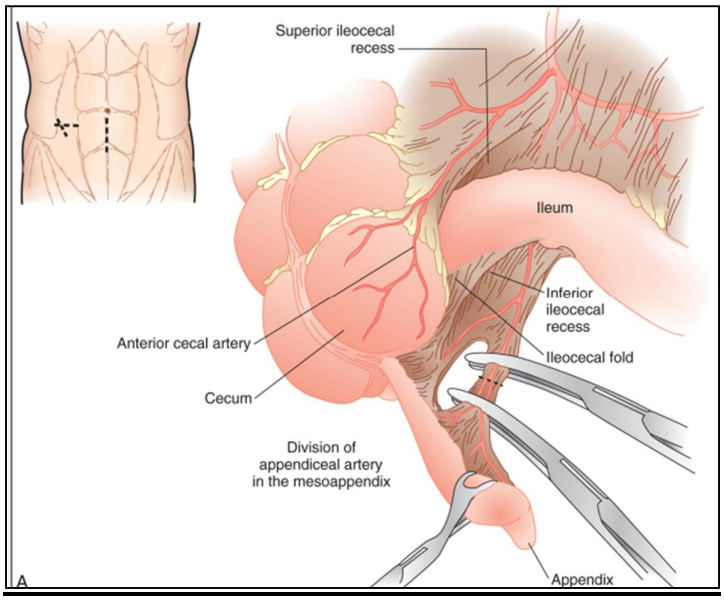
1. All three taeniae lead to and end at the base of the appendix.

2. The ileocecal junction can usually be identified, just below which is the base of the appendix.

   After identification, the mesoappendix is clamped and cut and the base of the appendix is crushed, clamped and cut. Peritoneal lavage is given in abscess and drain is fixed.[3].

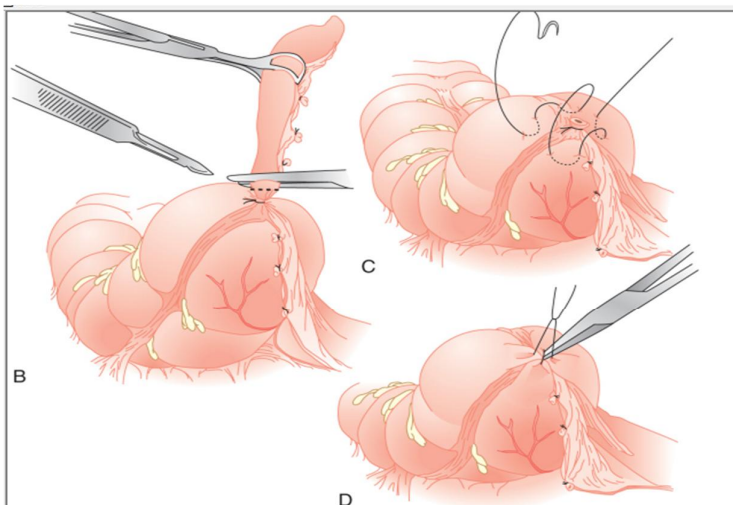


Various types of incisions in appendectomy.



Clamping of the mesoappendix in appendectomy

This is done with curved clamps and the meso-appendix is either trans-fixed or suture-ligated.



Clamping and Ligation of the base of the appendix

The base can be transfixed or ligated and in necrotic base, it can be buried inside cecum with purse-ring sutures.

LAPAROSCOPIC APPENDECTOMY:

The port sites are chosen as in the figure.

Usually one 10mm camera port and two 5mm working ports are used.

Pneumoperitoneum is attained to a pressure of about 14 mmhg.

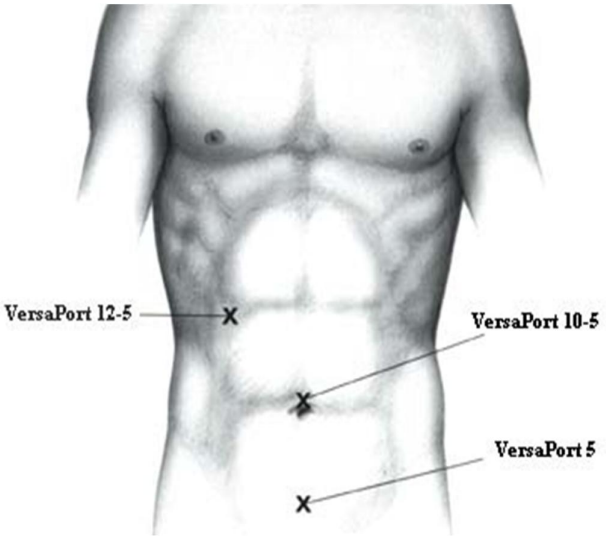
Using Maryland forceps and non-toothed or toothed graspers, mesoappendix is cauterized and base of appendix is ligated by endo-loop technique.

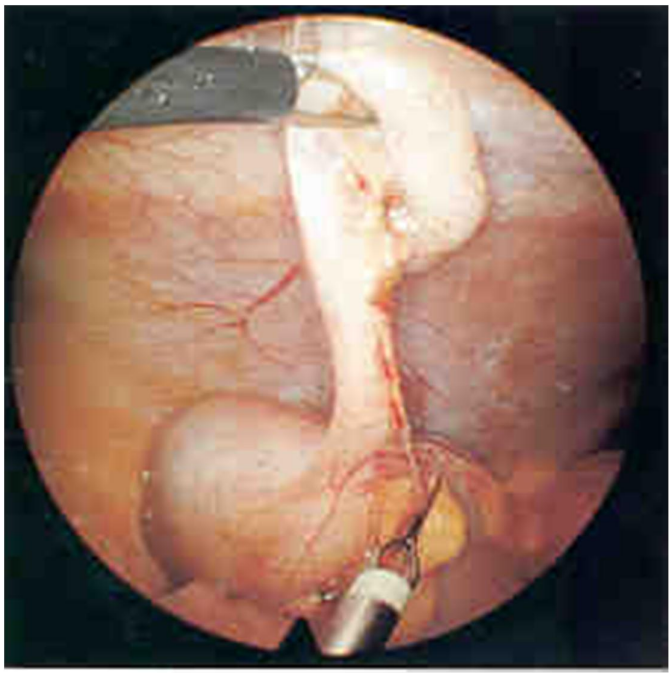
The appendix is extracted through any of the 5mm ports.

Pneomoperitoneum is released and port sites closed with prolene.

Conventional	**Robotic**	**Single Port**	**2 Port**
3-4 5mm ports	2 12-mm ports 3 8mm ports	1 25mm port	2 5mm ports
Total: 20mm	Total:48mm	Total: 25mm	Total:10mm

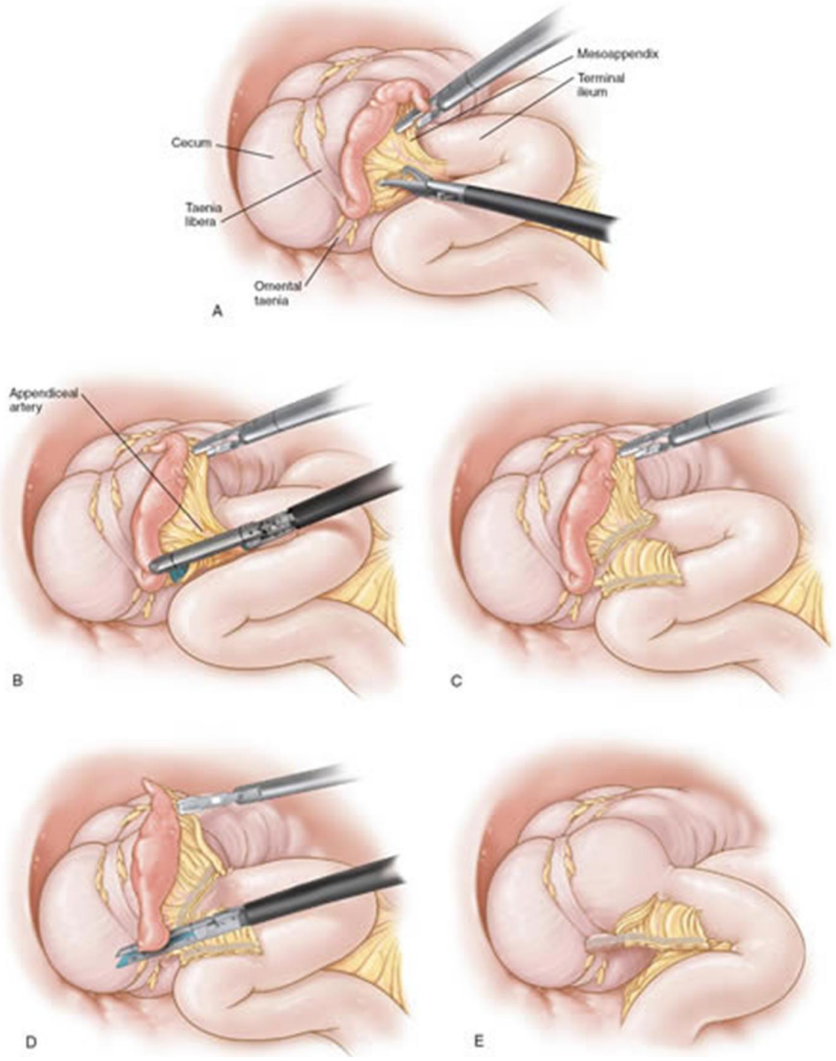
Port sites in minimally invasive surgeries for appendectomy





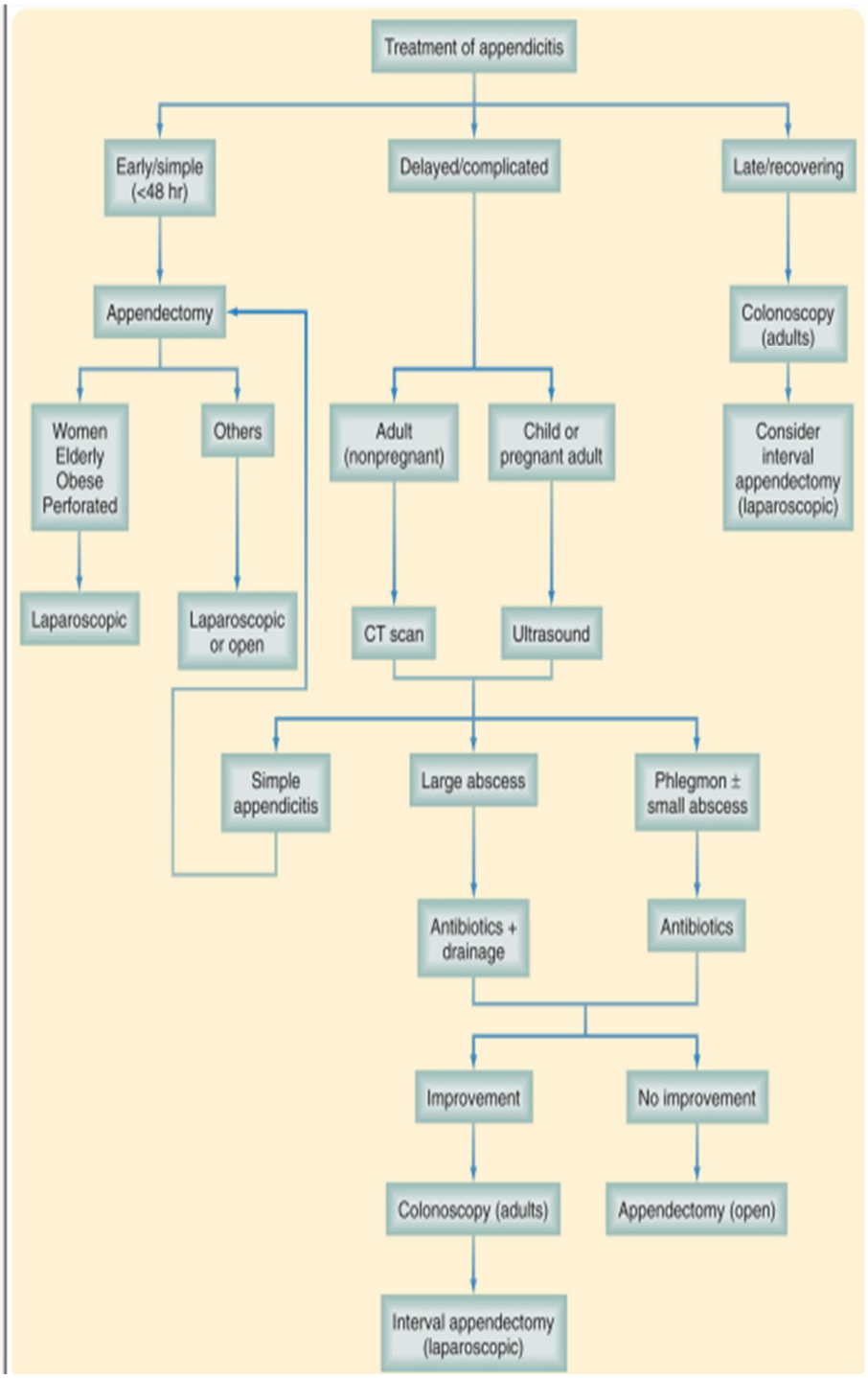
Laparoscopic View of Appendix

The appendix is traced upto its base where it attaches to the cecum and mesoappendix is cauterized or clips can be applied

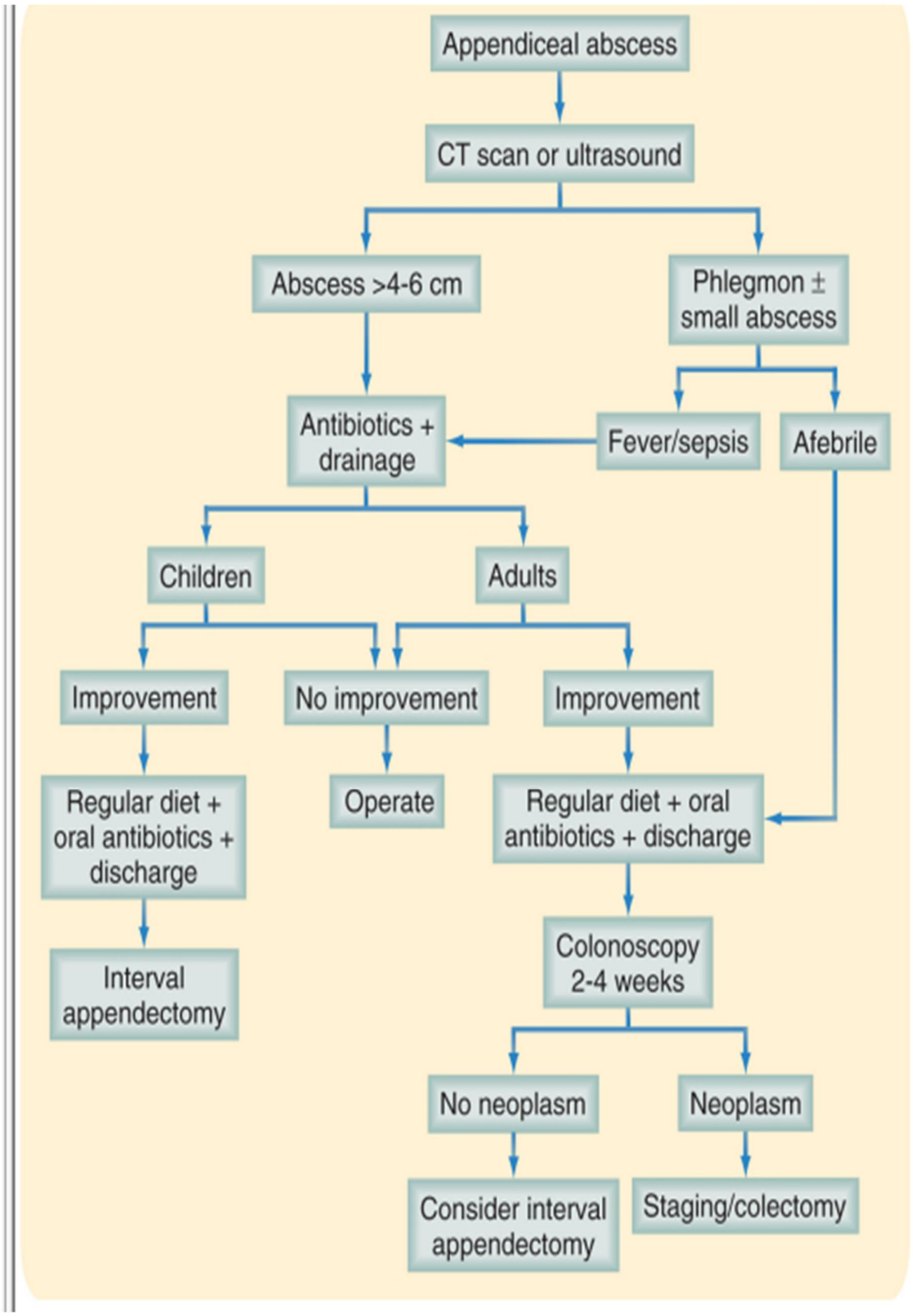


Steps In Laparoscopic Appendectomy

ALGORITHM FOR MANAGEMENT OF APPENDICITIS



MANAGEMENT OF APPENDICEAL ABSCESS



MATERIALS AND METHODS

PATIENTS AND METHODS

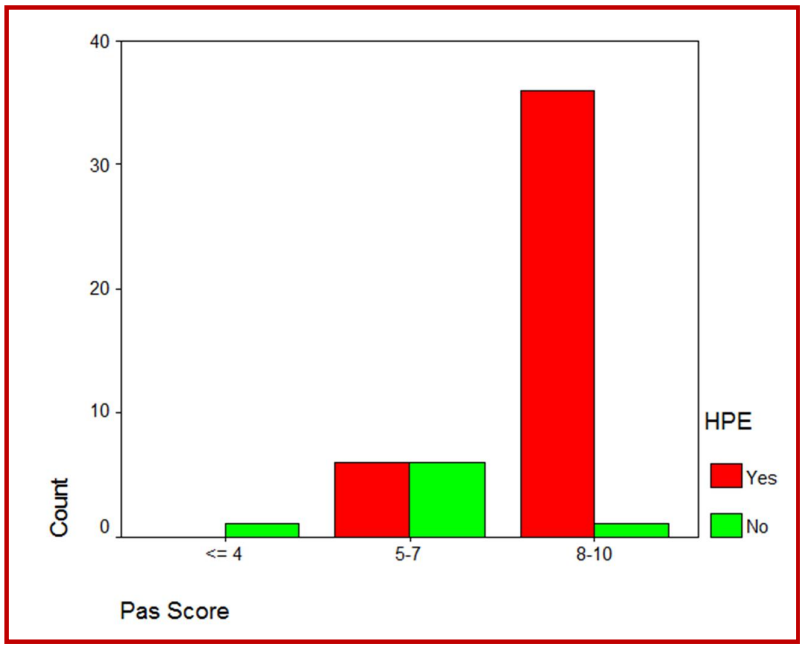
About 50 patients presenting to general surgery and pediatric surgery department in the age group 4-15 years with complaints of acute abdominal pain were chosen for the study. Detailed history-taking and complete physical examination were done. The patients were divided into 3 groups based on 8 variables in the PEDIATRIC APPENDICITIS SCORING system into those with scores >8, those with scores between 5-7, and those with scores <4.

The first group was taken up for surgery,namely emergency appendectomy either laparoscopically or by open technique. The second group of patients with score 5-7 was subsequently subjected to Ultrasonogram of the abdomen and were either taken up for surgery or followed up as in-patients with periodic re-assessment. The third group of patients with scores <4 were discharged and followed up as out- patients. Children who had previous history of appendectomy and those less than 4 years of age were excluded from the study.

			Intra-Op finding		Total
			Yes	No	
Pas Score	8-10	No. of children	36	1	37
		% within Pas Score	97.3%	2.7%	100.0%
		% with Intra-Op finding	85.7%	14.3%	75.5%
	5-7	No of children	6	6	12
		% within Pas Score	50.0%	50.0%	100.0%
		% with Intra-Op finding	14.3%	85.7%	24.5%
Total		No of children	42	7	49
		% within Pas Score	85.7%	14.3%	100.0%
		% within Intra-Op finding	100.0%	100.0%	100.0%

Correlation Of Pas Score With Intra-OP Findings

97.3 % of the children with scores 8-10 had appendicitis intra-operatively and 50% of those with scores 5-7 had appendicitis as intra-op finding



Distribution of Incidence of Appendicitis among the study group

Children with scores>8 had 84% of the total no of appendicitis cases.

Those with scores 5-7 had 50% had appendicitis

OBSERVATIONS AND RESULTS

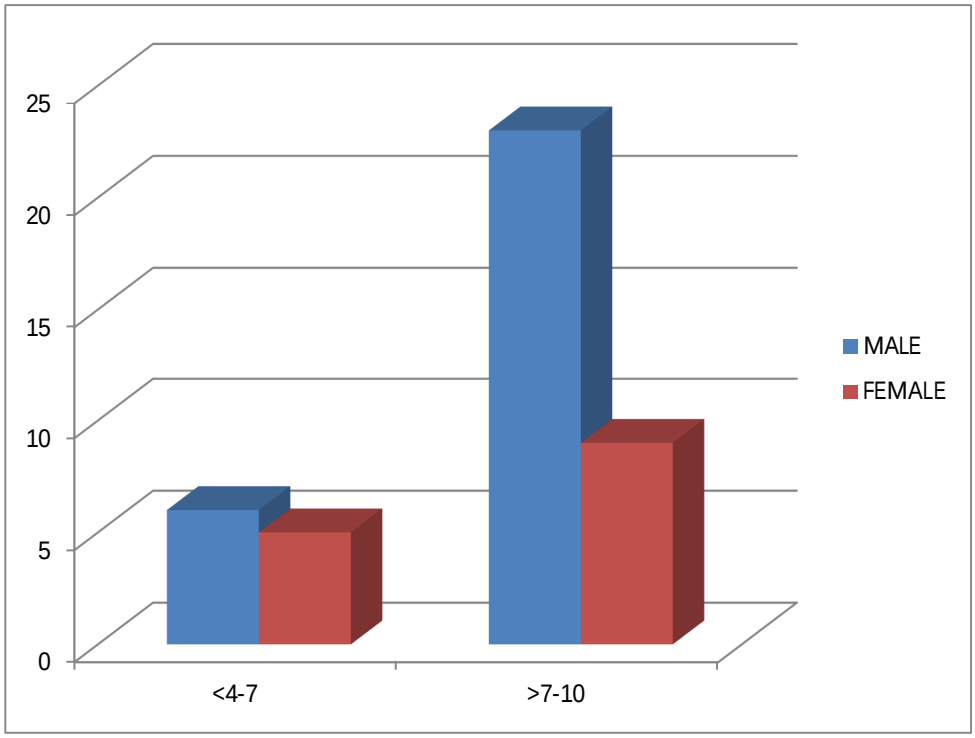
Of the 50 children, 37 of them had PAS scores of 8 or more.12 children had scores between 5-7 and were subsequently subjected to USG abdomen of which 6 of them had features suggestive of acute appendicitis and were taken up for surgery. Of the remaining 6 children, 3 had other mesenteric lymphadenitis and 3 had normal study. These patients were managed conservatively and they responded well to conservative treatment. There was 1child with PAS scores less than 4 and were discharged and followed up.

The intra-operative findings of the 43 patients (37+6) and the histopathology findings were taken as confirmatory evidence for appendicitis. Of the 43 patients, 42 patients with scores >5, had inflamed appendix and one patient with PAS score of 8 had normal appendix.

STATISTICS:

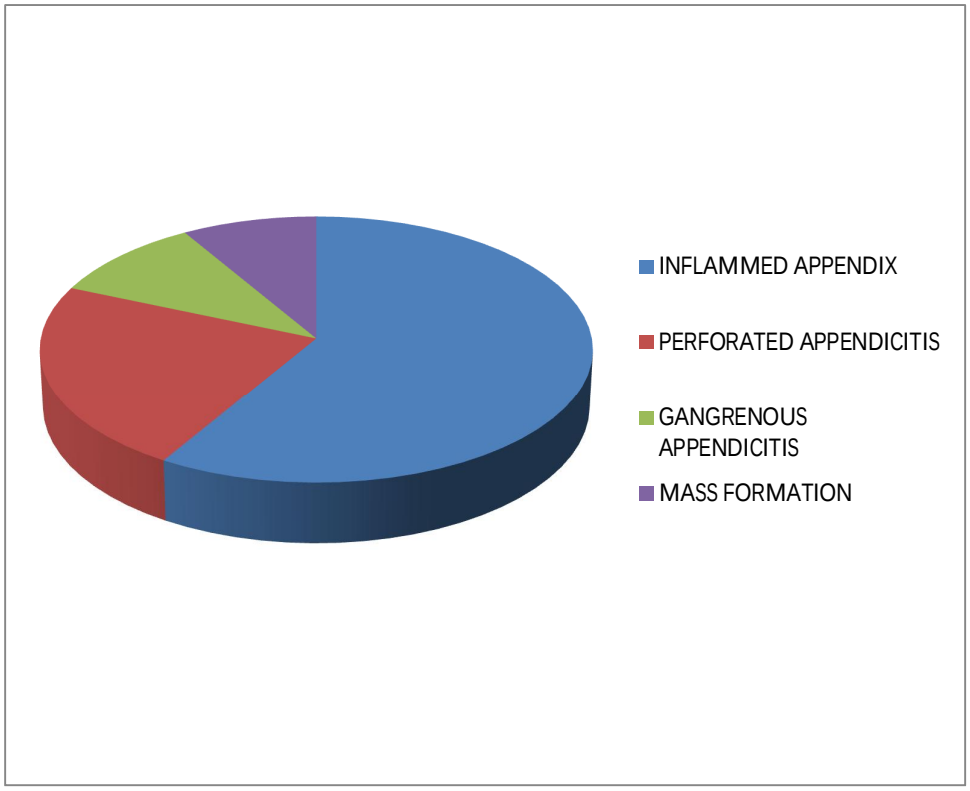
Age & sex:

The average age of children with appendicitis was 9.4 and the average age in non-appendicitis group was 5.7 years. The sex ratio between male and female appendix was 1.7:1.



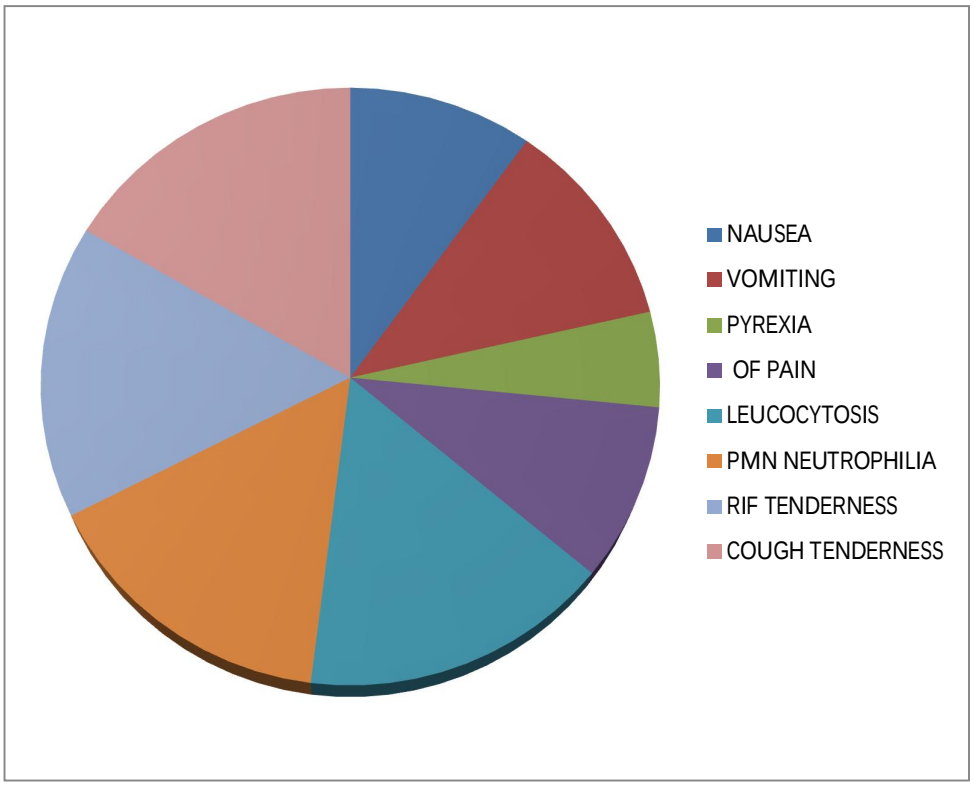
INCIDENCE OF APPENDICITIS IN MALE AND FEMALE WITH PAS SCORES

Male :female ratio was 1.8:1



DISTRIBUTION OF TYPES OF APPENDICITIS

Uncomplicated appendicitis was the most frequent presentation followed by perforated appendicitis and gangrenous appendicitis. One case had early mass formation and appendectomy was done.



DISTRIBUTION OF SYMPTOMS AND SIGNS

Cough tenderness was the most constantsign and most frequent symptom was nausea.

The order of diagnostic index of the variables was 1.percussion tenderness(85.7%), 2.anorexia(83.7%),

3. Nausea/vomiting,(83.5%) 4.tenderness in the right lower quadrant,(82%) 5. PMN neutrophilia (77.6%), 6.leucucytosis (77%), 7., 8.migratory pain(76.9%), all with a p value of <0.01.

The mean temperature for pyrexia was 38.1 C +/- 0.5C, and the mean leucocyte count was 13,300+/- 1,400.

The mean for PMN neutrophilia was 74%+/-7%.

After assigning the PAS scores the children were classified into appendicitis(43) and non-appendicitis(7) groups. The appendicitis group group were taken up for surgery and the non-appendicitis group were either observed or discharged. The intra-op findings and HPE findings were correlated and diagnosis confirmed and sensitivity, specificity and positive predictive values were calculated.

From the table below the overall sensitivity of the test was 85.7% and specificity was 97.3%. The positive predictive value was 97.3% but the negative predictive value was only 52.3%.

			HPE		Total
			Appendiciti	Normal	
Pas Score	8-10	No of children	36	1	37
		% within Pas Score	97.3%	2.7%	100.0%
		% within HPE	85.7%	14.3%	75.5%
	5-7	No of children	6	6	12
		% within Pas Score	50.0%	50.0%	100.0%
		% within HPE	14.3%	85.7%	24.5%
Total		No of children	42	7	49
		% within Pas Score	85.7%	14.3%	100.0%
		% within HPE	100.0%	100.0%	100.0%

Table correlating PAS SCORE with HPE report

97.3% of children with scores 8-10 had appendicitis confirmed on HPE and 50% of children with scores 5-7 had appendicitis..

DISCUSSION:

DEFINITION OF VARIABLES AND PARAMETERS:

Pyrexia – temperature > 37 .5 C

Leucocytosis- WBC> 10,000

PMN neutrophilia- >75 % of neutrophil count.

Migratory RIF pain- pain initially at the peri-umblical region later on migrating to right-iliac fossa

Percussion tenderness- tenderness over right iliac-fossa to gentle percussion

Cough tenderness- tenderness over RIF on asking the child to cough.

Anorexia – decrease in intake of food after the onset of pain.

USG findings suggestive of appendicitis- dilated, aperistaltic, non-compressible structure in the right iliac-fossa.

Thus, the PEDIATRIC APPENDICITIS SCORING SYSTEM has high sensitivity,specificity, and positive predictive value and poor negative predictive value. The results were comparable with the study done by

DR.MADHAN SAMUEL et all, and the study done by Ran Goldman in “Prospective Validation of the Pediatric Appendicitis Score” by RAN D. GOLDMAN, MD, SUSAN CARTER, BSC, DEREK STEPHENS, MD and “ The prospective validation of PAS on Canadian population by Maala Bhatt. The statistical inferences were comparable to the original study conducted by Prof.Madhan Samuel.

CONCLUSION

This study shows that PEDIATRIC APPENDICITIS SCORING SYSTEM is a useful diagnostic tool in the diagnosis of acute appendicitis in children. This clinical scoring system can be used in remote areas where other imaging modalities are unavailable and also can be used in the same patient during monitoring for re-assessment during follow-up.

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PROFORMA

• NAME : SL. NO:

• AGE /SEX:

• ADDRESS WITH CONTACT NUMBER:

• IP NO:

• DATE OF ADMISSION:

• DATE OF SURGERY:

• DATE OF DISCHARGE:

HISTORY OF PRESENTING ILLNESS:

PAIN ABDOMEN:

• Site--

• Duration-

• Nature-

• Aggravating/relieving factors-

• Radiation of pain-

• H/O NAUSEA/VOMITING IF ANY:

• H/O FEVER, IF ANY:

• H/O ANOREXIA:

PAST HISTORY:

Whether a known case of Asthma/TB/epilepsy/cardiac illness, ,CONGENITAL DISEASES

H/O SIMILAR EPISODES IN THE PAST, IF ANY:

H/O SURGERIES IN THE PAST, IF ANY

H/O MAJOR ILLNESS/ HOSPITAL ADMISSIONS, IF ANY

PERSONAL HISTORY:

Whether a smoker or an alcoholic,

FAMILY HISTORY:

TREATMENT HISTORY:

CLINICAL EXAMINATION:

GENERAL EXAMINATION:

SYSTEMIC EXAMINATION:

CVS

RS

CNS

LOCAL EXAMINATION:

PER ABDOMEN PALPATION

RIF TENDERNESS

PERCUSSION TENDERNESS

CLINICAL DIAGNOSIS:

INVESTIGATIONS:

• USG ABDOMEN AND PELVIS

• ROUTINE INVESTIGATIONS(CBC,RFT,CXR,ECG)

• OTHER INVESTIGATIONS(IF ANY):

FINAL DIAGNOSIS:

SURGERY DONE:

INTRO-OP FINDINGS:

HISTO-PATHOLOGY REPORT:

S.NO	NAME	AGE	SEX	I.P.No	NAUSEA/ VOMITING	ANOREXIA	FEVER	MIGRATION of PAIN	LEUCOCYTOSIS	NEUTRPHILIA	RIF TENDERNESS	PERCUSSION TENDERNESS	PAS SCORE	USG	INTRA-OP FINDING	HPE
1	JANARTHANAN	9	M	77178	1	1	-	-	1	1	2	2	8	-	INFLAMMED TIP OF APPENIX	F/S/O APPENDICITIS
2	KEERTHAN	12	M	77720	1	1	1	-	1	1	2	2	9	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
3	ARUN	11	M	76587	-	1	-	1	1	1	2	2	8	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
4	SWETHA	4 ½	F	78244	1	1	-	-	1	1	2	2	8	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
5	HARIHARAN	8	M	79674	-	1	1	-	-	-	2	2	6	MESENTRIC LYPHADENITIS	-	-
6	SHAIK MOHAMMAD	12	M	79996	1	1	1	-	1	1	2	2	9	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
7	IBRAHIM	6	M	80193	1	-	1	-	1	1	2	2	8	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
8	MUKESH	9	M	35007	1	1	1	-	-	-	2	-	5	NORMAL STUDY	-	-
9	PRAKASHI	9	M	82854	1	1	-	1	1	1	2	2	9	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
10	RITHICK KUMAR	11	M	38318	-	1	1	-	1	-	2	-	5	RIF PROBE TENDERNESS	INFLAMMED APPENDIX	F/S/O APPENDICITIS
11	MOHAMMAD YASIM	6	M	83635	-	-	1	-	1	-	2	-	4	-	-	-

12	SOUMIYA	12	F	83536	1	1	-	1	1	1	2	2	9	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
13	JACKULIN	11	F	39838	1	1	1	1	-	1	2	2	9	-	PERFORATED APPENDIX	F/S/O APPENDICITIS
14	LAKSHMANAN	7	M	82554	1	1	1	1	1	1	2	2	9	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
15	VALARMATHI	9	F	83830	1	1	-	1	1	1	2	2	8	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
16	PRADEEP	8	M	40041	1	1	1	-	1	1	2	2	8	-	Normal study	Normal study
17	SUMAIYA BANU	12	F	84038	1	1	-	1	1	1	2	2	9	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
18	VENKATESH	9	M	85584	1	-	-	1	1	1	2	2	8	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
19	SURYA	12	M	84452	1	1	-	1	1	1	2	2	9	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
20	SHRUTHI	7	F	84559	1	1	-	-	-	-	2	2	6	F/S/O APPENDICITIS	INFLAMMED APPENDIX	F/S/O APPENDICITIS
21	SARATHY	9	M	85719	1	1	-	1	1	-	2	2	8	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
22	PAVITHRA	12	F	85314	1	1	-	1	1	1	-	-	8	-	-	-
23	VICTOR	11	M	85613	1	1	1	-	1	1	2	2	9	-	EARLY APPENDICULAR MASS	F/S/O APPENDICITIS
24	MADHAVAN	7	M	54755	1	1	1	1	1	1		2	9	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
25	GOKUL RANI	6	F	86288	-	1	1	-	1	-	2	2	9	F/S/O APPENDICITIS	INFLAMMED APPENDIX	F/S/O APPENDICITIS
26	SOMA	9	F	86286	1	-	-	1	1	1	2	2	8	-	Gangrenous appendicitis	F/S/O APPENDICITIS
27	RIHANNA	9	F	86479	1	-	1	-	1		2	-	5	MESENTRIC ADENITIS	-	-

28	VINAY	12	M	86478	1	1	-	1	1	1	2	2	9	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
29	NARMADHA	4	F	86426	1	1	1	-	1	1	2	2	9	-	PERFORATED APPENDIX	F/S/O APPENDICITIS
30	VARUN	11	M	57775	-	1	-	1	1	1	2	2	8	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
31	SANGEETHA	10	F	86623	1	-	1	-	-	1	2	-	5	NORMAL STUDY	-	-
32	RAMYA	12	F	86772	1	1	-	1	1	1	2	2	9	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
33	SUKUMAR	8	M	66020	-	1	-	-	1	1	2	2	5	F/S/O APPENDICITIS	INFLAMMED APPENDIX	F/S/O APPENDICITIS
34	SIRAJ	10	F	59361	-	1	-	1	1	1	2	2	8	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
35	LOGESH	5	M	66217	1	1	-	1	1	1	2	2	9	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
36	MANIKANDAN	7	M	66196	-	1	1	1	1	1	2	2	9	-	PERFORATED APPENDIX	F/S/O APPENDICITIS
37	AJAY	9	M	66534	1	1	-	-	1	1	2	2	8	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
38	DEEPAK	10	M	66644	1	-	-	1	-	-	2	2	6	F/S/O APPENDICITIS	INFLAMMED APPENDIX	F/S/O APPENDICITIS
39	VASANTH	11	M	66848	1	1	-	-	1	1	2	2	8	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
40	SOFIA	10	F	66900	1	1	1	-	1	1	2	2	9	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
41	ADHILAKSHMI	11	F	11111	1	1	-	1	1	1	2	2	9	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
42	HELAN	9	F	67201	1	1	1	-	-	-	2	-	5	NORMAL STUDY	-	-
43	SRI DEVI	10	F	12084	-	1	-	1	1	1	2	2	8	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS

44	PREETHI	10	F	67381	1	1	-	-	1	1	2	2	8	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
45	KRITHIKA	9	F	67596	1	-	1	-	1	-	2	-	5	MESENTRIC ADENITIS	-	-
46	ABILASH	12	M	67709	-	1	-	1	1	1	2	2	8	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
47	MONISHA	9	F	68714	1	1	-	1	1	1	2	2	9	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
48	GOUTHAM	10	M	67902	-	1	-	-	1	-	2	2	6	F/S/O APPENDICITIS	INFLAMMED APPENDIX	F/S/O APPENDICITIS
49	EZHILARASI	5	F	68802	1	1	-	1	1	1	2	2	9	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS
50	SOLOMON	9	M	70154	1	-	-	1	1	1	2	2	8	-	INFLAMMED APPENDIX	F/S/O APPENDICITIS

குழந்தைகளுக்கு ஏற்படகூடிய ஒட்டு குடல் அழற்சி நோயை ஆரம்பத்திலேயே கண்டு பிடிக்க பயன்படும் PEDIATRIC APPENDICITIS SCORE எனும் பரிசோதனை முறை பற்றிய ஆராய்ச்சி முறை

சுய ஒப்புதல் படிவம்

பெயர் : **வயது :** **உள்ளிருப்பு எண். :**

எனது குழந்தைக்க, வயிற்று வலி தாங்கமுடியாதாதால் மருத்துவமனையில் அனுமதிக்கப்பட்டு உள்ளார். எனது குழந்தைக்கு ஒட்டுக் குடல் கீழ் பிடித்து வீங்கி இருக்க வாய்ப்பு உள்ளது என மருத்துவர்கள் கருதுகின்றனர்.

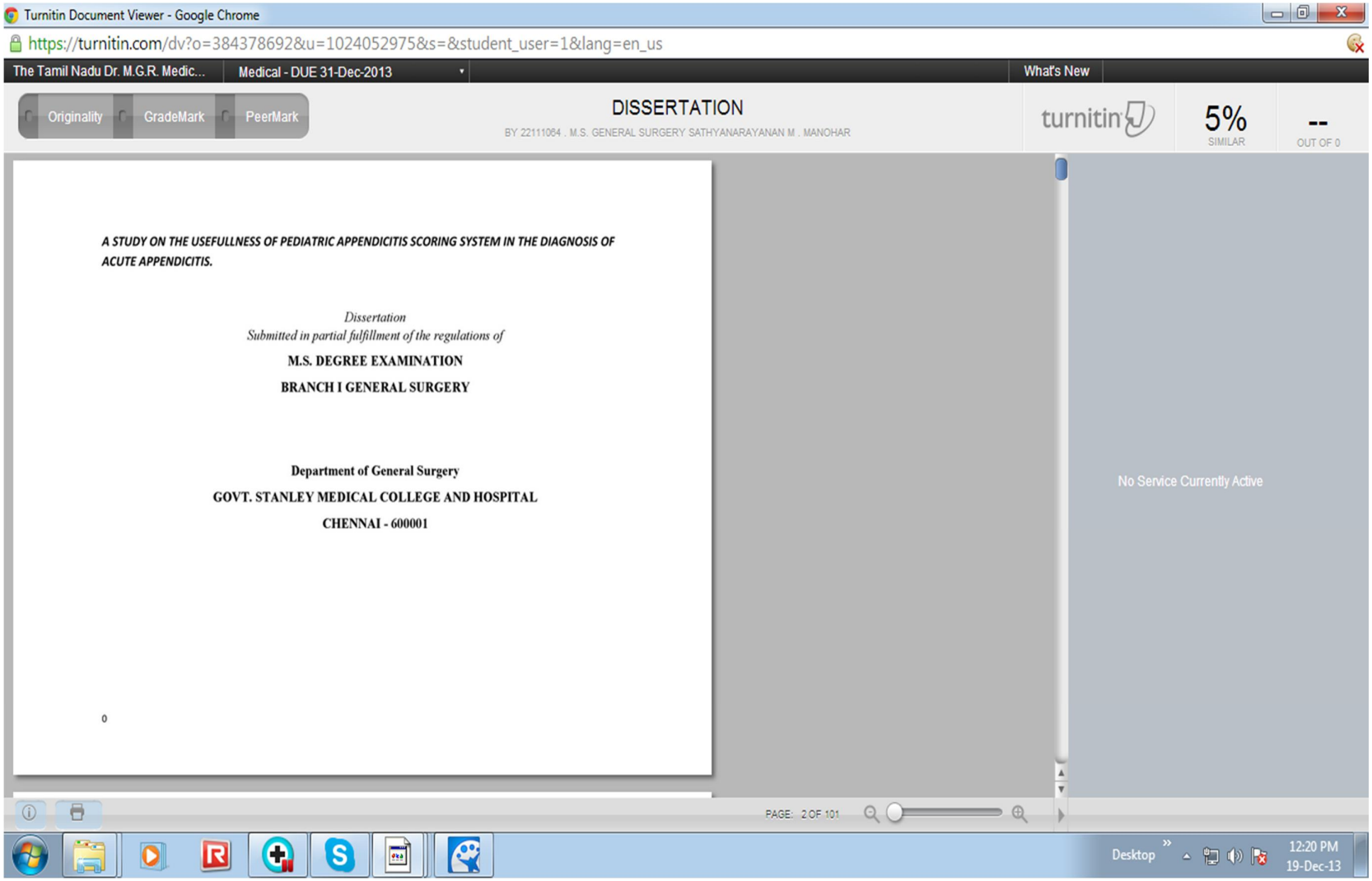
அவ்வாறு கீழ் பிடித்து உள்ளதா என அறிய அவர்கள் Pediatric Appendicitis Score எனும் மறையை பயன்படுத்தி அதை எனது குழந்தைக்கு பரிசோதனை செய்ய உள்ளனர் என அறிவேன். இந்த பரிமேசாதனையில், எனது குழந்தைக்கு ஒட்டு குடல் வீங்கி இருப்பதாக தெரிய வந்தால் அதை அறுவை சிகிச்சை மூலம் நீக்க சம்மதிக்கிறேன். இந்த ஆய்வின் முடிவுகள் மற்ற சிறு குழந்தைகளுக்கு ஒட்டு குடல் அழற்சி இருக்குமாயின் அதை ஆரம்பத்திலேயே பயன்படும் கருவியாக இருக்க கூடும் என்பதினால் இந்த ஆய்வில் பங்கேற்ற சம்மதிக்கிறேன்.

இப்படிக்கு,

ஆய்வாளர் கையொப்பம் **நோயாளியின் பெற்றோர் கையொப்பம்**

PATIENT INFORMATION BROCHURE

ஒட்டுக்குடல் என்பது மனிதனை உடலின் பெருங்குடலின் ஆரம்பத்தில், பெருங்குடலோடு இணைந்து உள்ள, சிறு புழு போன்ற சிறு உருப்பாகும். அது சீழ் பிடித்தால், அதற்கு Appendicitis (ஒட்டு குடல் அழற்சி) என ஆகும். அதை முறையாக அறுவை சிகிச்சை செய்து நீக்காவிட்டால், அது வெடித்து, வயிற்றில் சீழ் பரவி, உயிருக்கே ஆபத்து ஏற்படகூடும் என அறிவேன்.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